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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/987,031	11/13/2001	Kenji Kamada	N36-138996M/TH	6620
30743	7590	12/19/2003	EXAMINER	
WHITHAM, CURTIS & CHRISTOFFERSON, P.C. 11491 SUNSET HILLS ROAD SUITE 340 RESTON, VA 20190			HUG, ERIC J	
			ART UNIT	PAPER NUMBER
			1731	

DATE MAILED: 12/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/987,031

Applicant(s)

KAMADA ET AL.

Examiner

Eric Hug

Art Unit

1731

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 12-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 12-18 is/are rejected.
- 7) ☒ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

Response to Amendment

The following is in response to the amendment filed on September 21, 2003.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claims 1-4, 6, 12, 13, and 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Myhre (EP 0 936 022). Myhre discloses a laser means for forming grooves in a glass electrical heating element without cracking or breaking the glass. A CO₂ laser (pulsed) is used. Figure 4 shows a concave shaped groove formed in the glass element (see also column 4, paragraphs [0024] and [0025]). The shape of the groove depends on the intensity and wavelength of the laser, the focus of the laser beam (i.e. the distance of the focal point from the glass surface), and how fast the beam moves over the glass surface. A beam focused at the surface results in a narrow and deep groove (narrow v-shape). A beam focused above the surface of the glass results in a wide but shallow groove. How wide and deep the groove becomes depends on the chosen combination of laser intensity, wavelength, focus, and speed.

Therefore, Myhre teaches forming concave grooves with a laser condensed (focused) above the glass surface. With respect to the claimed conical and v-shaped grooves, this would be an inherent result between the narrow, deep groove where the beam is focused directly on the surface and the wide, shallow groove where the beam is focused far above the surface. Thus, all of the claimed shapes and claimed angles between the side surfaces are encompassed by Myhre.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-6 and 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minakata et al (US 6,219,469) in view of Haight et al (US 6,333,485) and further in view of legal precedent. Minakata discloses a process of forming a v-shaped groove into the surface of a glass substrate using pulsed laser ablation, whereby the laser is focused at or beneath the surface of the glass (see Figures 2a, 2b, 3b, 4a; column 7, line 51 to column 8, line 56). The size and shape of the groove is affected by the focus point of the laser. Minakata differs from the present invention in that there is no explicit description of focusing the laser above the surface of the glass, nor description of using a laser with pulse width not larger than 10 picoseconds.

Haight discloses a method for pulsed laser ablation of a surface of a material, whereby a laser beam is focused above the surface of the material in order to prevent material damage. Haight is cited here to provide motivation for focusing a laser above the surface of a glass substrate when forming a groove in order to avoid damage to the glass substrate. Haight also teaches that it is desirable to operate the pulse width on the order of femtoseconds and picoseconds to limit the damage. The lasers in Minakata and Haight have similar wavelengths and energies. Therefore, at the time of the invention, it would have been obvious to one skilled in the art to modify the method of Minakata for forming a v-shaped groove in a glass substrate by focusing the laser above the glass surface as taught Haight to produce the desired groove shape with minimal damage to the glass substrate. It would have also been obvious to use a

short pulse width on the order of femtoseconds to picoseconds (which reads on less than 10 picoseconds) as taught by Haight to limit the depth of the groove formed with the laser.

With respect to the claimed glass substrate dimensions, groove width, and groove depth, this would be an inherent result in the waveguide of Minakata, or would be deemed unpatentable in view of *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984): the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device, and where a device having the claimed relative dimensions would not perform differently than the prior art device, then the claimed device was not patentably distinct from the prior art device. In this case, both the claimed invention and Minakata pertain to laser ablating a groove into the surface of a glass substrate for forming an optical waveguide device.

Response to Arguments

Applicant's arguments filed on August 15, 2003 are persuasive with respect to the rejections based on Lumley (US 3,610,871) presented in the previous office action. Lumley is concerned with cutting a glass substrate rather than with forming a concave or V-shaped groove. Therefore, all rejections presented previously have been withdrawn.

With respect to arguments regarding Rafla-Yuan et al (US 5,961,852), Rafla-Yuan is concerned with scribing glass sheets to a particular depth so that the glass can be broken cleanly. To form the scribes, a pulsed short wavelength laser is used to limit the depth of the scribes. Although not cited above, this reference is considered relevant to the present invention.

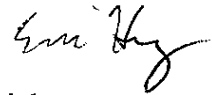
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Applicant's amendments to the claims have overcome the rejection of claim 4 under 35 U.S.C. 112, second paragraph, presented previously.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Hug whose telephone number is 703 308-1980. The examiner can normally be reached on Monday through Friday, 9:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 703 308-1164. The fax phone number for the organization where this application or proceeding is assigned is 703 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0651.



jeh


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